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Abstract of the Disclosure

Silicon carbide films are grown by carburization of silicon to form insulative films. In one embodiment, the film is used to provide a gate insulator for a field effect transistor. The film is grown in a microwave-plasma-enhanced chemical vapor deposition (MPECVD) system. A silicon substrate is first etched in dilute HF solution and rinsed. The substrate is then placed in a reactor chamber of the MPECVD system in hydrogen along with a carbon containing gas. The substrate is then inserted into a microwave generated plasma for a desired time to grow the film. The microwave power varies depending on substrate size. The growth of the film may be continued following formation of an initial film via the above process by using a standard CVD deposition of amorphous SiC. The film may be used to form gate insulators for FET transistors in DRAM devices and flash type memories. It may be formed as dielectric layers in capacitors in the same manner.

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Matthew Hollister
(Name)

Hollister
(Signature)

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